

REMARKS/ARGUMENTS

Claims 1, 5-12, and 36-48 are pending upon entry of this amendment. New claims 45-48 have been added. No new matter has been added by the addition of the new claims.

Claims 1, 5-9, 11, 36-41, and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fischer U.S. Patent No. 5,422,139.

Claims 10, 12, 41, and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fischer, U.S. Patent No. 5, 442,139, in view of Adomaitis et al., International Publication No. WO 02/08487.

Claims 1, 5-9, 11, 36-41, and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fischer U.S. Patent No. 5,422,139 in view of Muller et al., U.S. Patent No. 6,537,418.

Claims 10, 12, 42, and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fischer U.S. Patent No. 5,422,139 and Muller et al., U.S. Patent No. 6,537,418, as applied to claims 1, 5-9, 11, 36-41, and 43 and further in view of Adomaitis et al, International Publication No. WO 02/08487.

Claim Rejections - 35 U.S.C. § 103

In reviewing the Office action, Applicants note that the Examiner admits that Fischer does not teach that the ratio of the first area to the second area varies as a function of the radial distance from the center of the gas distribution showerhead. (Office action at pages 3 and 6). To provide for this missing teaching, the Examiner states: "Optimizing the size of the apertures of a showerhead is required in order to optimize the flow in the process chamber, and for each process in which the showerhead is used." (Office action at page 3). However, the Examiner is respectfully reminded that in order to establish a *prima facie* case of obviousness:

there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (MPEP § 2143).

Such teaching or suggestion to make the claimed combination must be found in the prior art, not in Applicants' own disclosure. In re Vaeck, 947 F.2d 488 (Fed.Cir. 1991).

Here, there is absolutely no teaching in Fischer to motivate the modification of Fischer's chamber to include varying the ratio of the gas distribution areas as a function of the radial distance. On the contrary, Fischer states that "a distribution effect of the treatment can be changed by varying the distance d between the pairs of openings at the here planar surface 1, or by a varying of the infeed conditions, or the draw off conditions, such as the feed rate of the infeed, and the feed rate of the drawing off." (Fischer at col. 7, lines 17-22, emphasis added). Thus, although Fischer discusses several techniques for adjusting the distribution effect, there is no teaching or suggestion to incorporate the claimed elements.

The Examiner is respectfully reminded that to guard against the tempting trap of hindsight, the evidence of a suggestion, teaching, or motivation to combine "must be clear and particular." In re Dembiczak, 50 U.S.P.Q.2d, 1614, 1617 (Fed.Cir. 1999) (citation omitted). Because Fischer discusses several techniques for adjusting the distribution effect but fails to teach or suggest the claimed elements, Applicants respectfully assert that the Examiner has simply provided a motivation based on the present disclosure.

Additionally, in order to support the pending rejections under Section 103, the Examiner relies on *Gardner v. TEC Systems, Inc.* However, referring to *Gardner*, MPEP § 2144.04(IV)(A) clearly states that the holding of *Gardner* is applicable when "a device having the claimed relative dimensions would not perform differently than the prior art device." (emphasis added). Here, as discussed throughout the present specification and below, the variation of the ratio of the gas distribution apertures to the exhaust apertures does, in fact, modify the performance of the claimed embodiments in comparison with a conventional gas distribution showerhead. Thus, the modification proposed by the Examiner is improper and Applicants respectfully submit the rejections under Section 103 should be withdrawn.

Fischer appears to use the pair of openings 3, 5 illustrated in FIG. 4 to provide "the local U-flow" in order to change the treatment of the wafer at area 6a opposite the openings and "specifically substantially only within this [6a] area and not at the adjacent areas of the surface 6." (Fischer at col. 7, lines 11-16 and at col. 9, lines 2-6).

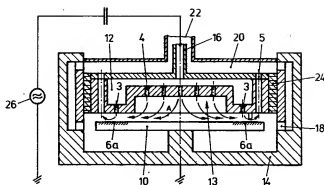


FIG. 4

Although the text of Fischer is unclear, the array 13 of substantially equally distributed similar infeed openings 4 results in "a not controllable, substantially radially outwards decreasing distribution of the rate of the fed-in fresh reaction gas and gaseous reaction products at the surface of the substrate." In discussing the operation of the treatment chamber illustrated in FIG. 6, Fischer refers to FIG. 7B as apparently illustrating loss of local control when "the treatment gas which is fed flows over longer surface areas of the substrate and is increasing consumed." (Fischer at col. 9, lines 46-49 and lines 56-59).



FIG. 7b

FIG. 4 also illustrates peripheral region 6a. In contrast with the central area adjacent the array 13, the rate is controllable in the peripheral region 6a on account of the local U-flow in the peripheral region 6a. (Fischer at col. 8, line 55 - col. 9, line 6). Thus, Fischer appears to provide a uniform array of infeed openings 4 in the center region (with a radially decreasing distribution rate) and pairs of openings in the peripheral region (to provide local U-flow).

Varying the ratio of the gas distribution apertures to the exhaust apertures as a function of radial distance as suggested by the Examiner would change the distribution rates taught by Fischer. If Fischer were to be modified, the modified device incorporating the claimed elements would perform differently than the prior art device. In particular, the distribution rates as a function of radial distance would be changed. Because the modified device would perform differently, *Gardner* is not applicable. Therefore, Applicants respectfully submit that the

claimed embodiments are not rendered obvious either over Fischer alone or over Fischer in view of the other cited references. For at least these reasons, Applicants respectfully request that the pending rejections of independent claims 1 and 36 be withdrawn. For at least these reasons, claims 1 and 36 are in condition for allowance.

Claims 5-12 and 45-46, which depend from claim 1, are in condition for allowance, for at least the reasons discussed in relation to claim 1, as well as for the additional elements they recite.

Claims 37-44 and 47-48, which depend from claim 36, are in condition for allowance, for at least the reasons discussed in relation to claim 36, as well as for the additional elements they recite.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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